



## PATENT ABSTRACTS OF JAPAN

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(54) OPTICAL SIGNAL TRANSMISSION AND RECEPTION MODULE

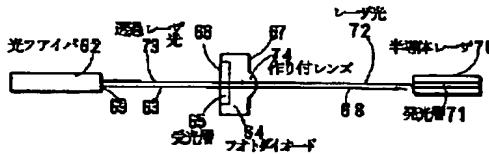
beam 73 is converged by the built-in lens 74 and is made incident into the inside of the optical fiber 62.

(57) Abstract:

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**PROBLEM TO BE SOLVED:** To make it possible to decrease the number of parts coupled to a single mode fiber and to reduce the size and cost of a module by partly absorbing reception light by a light receiving element, converting this light into an electric signal, condensing the light for transmission remaining without being absorbed in the light receiving element by a built-in lens and making this light incident on an optical transmission path.

**SOLUTION:** The light from a station side propitiating in an optical fiber 62 emerges from the end face of this optical fiber 62 and turns to the light 63 spreading at the angle determined by its numerical aperture. This light enters the light receiving layer 65 of a photodiode 64 existing just before the optical fiber. About half the light is absorbed therein. The absorbed light changes to an electric signal. The remaining half of the light transmits the layer. The reception light emerges from the light emitting layer 71 of a semiconductor laser 70. This light enters the photodiode 64 from its rear surface 67 and about half thereof is absorbed in the light receiving layer 65 and is loss. The light of the power of the remaining half emerges to a space 66 from the front surface. The transmitted laser



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(21)Application number : 09-225877 (71)Applicant : SUMITOMO ELECTRIC IND LTD  
 (22)Date of filing : 06.08.1997 (72)Inventor : KUHARA MIKI  
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 SAITO ITARU

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## (54) OPTICAL SIGNAL TRANSMISSION AND RECEPTION MODULE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To make it possible to decrease the number of parts coupled to a single mode fiber and to reduce the size and cost of a module by partly absorbing reception light by a light receiving element, converting this light into an electric signal, condensing the light for transmission remaining without being absorbed in the light receiving element by a built-in lens and making this light incident on an optical transmission path.

**SOLUTION:** The light from a station side propitiating in an optical fiber 62 emerges from the end face of this optical fiber 62 and turns to the light 63 spreading at the angle determined by its numerical aperture. This light enters the light receiving layer 65 of a photodiode 64 existing just before the optical fiber. About half the light is absorbed therein. The absorbed light changes to an electric signal. The remaining half of the light transmits the layer. The reception light emerges from the light emitting layer 71 of a semiconductor laser 70. This light enters the photodiode 64 from its rear surface 67 and about half thereof is absorbed in the light receiving layer 65 and is loss. The light of the power of the remaining half emerges to a space 66 from the front surface. The transmitted laser beam 73 is converged by the built-in lens 74 and is made incident into the inside of the optical fiber 62.




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